

STEM Education
Learning Activity Exemplar
Liu Po Shan Memorial College

Learning Activity: Design and Make a Solar Stove Level/ Key Stage: S1

<input checked="" type="checkbox"/> Based on topics of a KLA	<input type="checkbox"/> Project learning
KLA: <input checked="" type="checkbox"/> SE <input type="checkbox"/> ME <input type="checkbox"/> TE	

Major L&T mode/ strategies (more than 1 could be chosen):

- Enquiry learning
 Problem-based learning
 e-Learning
 Cooperative learning
 Design & make
 Direct teaching
 Others: _____

Learning objectives (include generic skills, e.g. creativity, collaborative and problem-solving skills):

Students should be able to:

1. enhance collaboration skills and problem solving skills by creating an eco-friendly solar stove that uses clean energy
2. apply knowledge of conduction, convection and radiation

Prerequisite knowledge:

1. Different forms of energy
2. The use of renewable energy sources

Learning difficulties:

1. Design an effective solar stove that can cook an egg
2. Identify factors affecting the effectiveness of a solar stove (e.g. size, materials, type)

	Learning focus	Curriculum content/ elements involved	KLA		
			SE	ME	TE
1.	<ul style="list-style-type: none"> • Different heat transfer processes: conduction, convection and radiation • Factors affecting conduction, convection and radiation • Examples of the applications of conduction, convection and radiation 	Unit 5 Energy Unit 5.2 Heat transfer	✓		

Remarks: The school joined the STEM Education support service provided by the SBCDS Section of the EDB. This exemplar is one of the school-based learning and teaching materials developed by the school in collaboration with the Section.

2.	• The need for developing alternative energy sources (e.g. solar energy)	Unit 5 Energy Unit 5.3 Energy sources – Alternative energy sources	✓		
3.	Solving problems involving volumes and surface areas	Measures, Shape and Space Strand Learning Unit 18 Mensuration -18.4		✓	
4.	Safe use of tools and equipment: How basic hand tools are used to process materials (e.g. cutter)	Learning Element (K5) Tools and Equipment			✓
5.	Design consideration: Basic consideration factors in design: material used, colour & shape, size & weight, function and aesthetic	Learning Element (K6) Production Process			✓

Assessment:

Criteria	Weighting
Can cook egg white (time taken for the colour to turn white)	30%
Can heat up water (increase in temperature of water)	30%
Design (including portability)	20%
Cost	10%
Worksheet	10%

Brief:	<p>The main purpose of the project is to replace old wood fuel stoves with an eco-friendly solar stove that uses clean energy.</p> <p>Design and make a solar stove in groups. The solar stove should serve the function of cooking eggs using solar energy instead of electricity or fuel and also meet the constraints of given volume and surface area taking effectiveness and material cost into consideration.</p>
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